

DRAFT CHECKLIST ENVIRONMENTAL ASSESSMENT ON THE FINAL RECLAMATION PLAN FOR THE CR KENDALL MINE

COMPANY NAME: CR KENDALL CORPORATION

Project: KENDALL MINE

LOCATION: HILGER, MONTANA

County: FERGUS

PROPERTY OWNERSHIP: ☐ Federal ☐ State ☒ Private

BACKGROUND: The CR Kendall Mine is located approximately seven miles west of Hilger, MT in Township 18N, Range 18E, Sections 29, 30, 31, and 32. The CR Kendall mine is currently inactive. CR Kendall Corporation (CRK) stopped ore processing activities in the fall of 1997. During the mine's operational life since 1984, approximately 460 acres were disturbed and at year-end 2000 approximately 138 acres remained to be reclaimed. Of this unreclaimed acreage, the majority encompasses the ore processing areas in Mason Canyon including two heap leach pads, the process plant, process water ponds and several ancillary buildings and roads. Other reclamation needed includes some resloping and backfilling of the Kendall and Barnes King pits as well as several access roads, mine shop facilities and soil stockpile areas.

In January 1999, CRK submitted an application to amend its reclamation plan. The principal modification requested was to change the thickness of the reclamation covers from approximately 54 inches to 22 inches for the leach pads and remaining waste rock dumps. The reclamation cover design in effect at the time of CR Kendall's 1999 amendment request called for 12 inches of compacted clay (clayey waste rock) overlain by 12 inches of drain material (pit run limestone), followed by 18 inches of subsoil (suitable waste rock with some soil-like properties), and capped with 10 to 14 inches of stockpiled topsoil, for a total of 52 to 56 inches of cover material. CRK's plan submitted in 1999 proposed 12 inches of approved waste rock subsoil overlain by 10 inches of topsoil for a total of 22 inches of cover. The rationale for the change was based on seepage modeling conducted by the company which suggested that there was minimal net benefit (from a seepage standpoint) between the 52 to 56-inch cap and the proposed 22-inch cap. Based on laboratory analysis, CRK claimed the volume of water passing through each cover profile in the course of a year would be approximately the same.

As part of the Montana Department of Environmental Quality's (DEQ) review of CR Kendall's application and preparation of a reclamation bond update, an EA was completed in June 2000 ("Environmental Analysis of Revised Bond Calculations for the CR Kendall Mine"). DEQ concluded that since soil moisture is integral to overall reclamation success, a thicker cap would be more beneficial to plant growth and sustainability over the long term. DEQ also concluded that at a minimum, the existing volumes of stockpiled topsoil and subsoil should be used in any reclamation scenario. There is enough material to place a cover of 36 inches (17 inches topsoil and 19 inches subsoil) over the leach pads and remaining waste dumps while reserving 8 to 10 inches of topsoil for other non-reclaimed areas. The cover sequence of 36 inches for leach pads and 8 to 10 inches for other areas was approved in 2000 and is the current approved plan of record.

On February 9, 2001, DEQ and CR Kendall Corporation, owner of the CR Kendall Mine, entered into an agreement, whereby reclamation bond money in the amount of \$1,869,000 held through a surety bond would be provided to DEQ for the exclusive use in reclaiming the CR Kendall Mine. DEQ would administer these funds and would have oversight and final decision making authority over reclamation activities at the site. CR Kendall would work cooperatively with DEQ in the development of a comprehensive reclamation plan and would provide assistance to DEQ to ensure that available reclamation funds are used efficiently.

As part of the agreement, CR Kendall provided an amended reclamation and water management closure plan for Operating Permit 00122 for DEQ's consideration on March 8, 2001. The amended closure plan included the previously approved reclamation plan.

Copies of the application can be reviewed by the public at DEQ offices at 1520 E. 6th Ave., in Helena, MT or in the Lewistown Public Library at 701 W. Main St., Lewistown, MT. The text of the application is also available on the DEQ web page www.deq.state.mt.us.

TYPE AND PURPOSE OF ACTION: DEQ and CR Kendall are pursuing final reclamation at the site. In June 2000, DEQ prepared a revised bond calculation based on a DEQ modified cover profile for the remaining reclamation areas at the mine. As part of that calculation, DEQ made certain assumptions regarding the reclamation of these remaining areas. The assumptions addressed the reclamation cover type and thickness, and the collection and treatment of water on the mine site. DEQ has re-examined the approved reclamation plan for the CR Kendall Mine now that reclamation is expected to commence in 2001. This EA evaluates two alternative reclamation cover type and thickness plans. This EA does not address the proposed water management plan changes.

The areas comprising the majority of the surface area yet unreclaimed include leach pads 3 and 4, and the Kendall and Barnes King pits. Now that final reclamation is imminent, DEQ is confirming the assumptions made as part of the earlier reclamation estimate and proposes to make adjustments to the reclamation based on additional information.

This EA re-examines the utility of placing 19 inches of approved waste rock subsoil on the leach pads and on the remaining unreclaimed waste rock dumps, as required by the previously approved plan. This EA examines also whether the leach pad material is itself as good as or better than the waste rock currently stockpiled and approved for a subsoil growth medium. Equal amounts of topsoil would be applied under all circumstances, whether or not stockpiled subsoil is placed below the coversoil. Specifically, DEQ proposes to:

- Make changes to the reclamation cover requirements for the leach pads and the remaining mine pit and waste rock areas by eliminating 19 inches of mine waste rock which was previously approved for a subsoil in the reclamation cover cap. The EA justifies the elimination by citing the similarity of physical and chemical characteristics of the subsoil versus the characteristics of the in-place leach pad and waste dump material. The revised cover would consist of 17 inches of topsoil only over the leach pad ore and mine waste rock.
- The 19 inches of mine waste rock that had been previously approved for subsoil would be used for other reclamation purposes, particularly to reclaim some other highwalls in the pits.

N = Not present or No Impact will occur.

Y = Impacts may occur (explain under Potential Impacts).

NA = Not applicable

IMPACTS ON THE PHYSICAL ENVIRONMENT																			
RESOURCE	[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES																		
1. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE: Are soils present which are fragile, erosive, susceptible to compaction, or unstable? Are there unusual or unstable geologic features? Are there special reclamation considerations?	<p>[Y] The 17 inches of stockpiled topsoil would be used in either alternative reclamation plan. Stockpiled topsoil lacks nutrients, particularly potassium (K) and phosphorus (P), for optimal plant growth. Proper fertilization at the time of seedbed preparation will promote good plant establishment and growth, resulting in greater transpiration (less water percolating through covers) and less erosion. Irrigation with process water provides some nitrogen replenishment; otherwise nitrogen fixation is desirable. Topsoil would benefit from organic compost that introduces beneficial microorganisms as well as a food source for them and nutrients. The benefits of compost would be greatest at nonirrigated sites.</p> <p>In the June 2000 bond review that approved the placement of 19 inches of waste rock with soil-like properties for subsoil in the cover system, the justification for its use was based primarily on the assumption that the subsoil material would provide a better growth medium for plants than the leach pad ore. DEQ based this conclusion on assumptions regarding water-holding capacity, potential for metals uptake and rooting depth provided by the substrate.</p> <p><u>COMPARISON OF SUBSOIL TO LEACH PAD MATERIAL</u> <u>Physical and Chemical Data:</u> DEQ resampled the stockpiles in 2001 (see Appendix A: Kendall Mine Comparative Coversoil Evaluation and Revegetation Recommendations). A comparison of some important physical, chemical and organic characteristics between the subsoil and the leach pad ore appears below:</p> <table><tr><th></th><th>Texture</th><th>Thallium ppm*</th><th>Arsenic ppm</th><th>Organic Content</th><th>Fertility</th></tr><tr><td>Subsoil</td><td>Loam</td><td>70-130 ppm</td><td>350-430 ppm</td><td>low</td><td>low N, P, K**</td></tr><tr><td>Ore</td><td>Loam</td><td>130 ppm</td><td>270-370 ppm</td><td>low</td><td>Hi N;Low P,K</td></tr></table> <p>*ppm = parts per million **N,P,K = nitrogen, phosphorus, potassium</p>		Texture	Thallium ppm*	Arsenic ppm	Organic Content	Fertility	Subsoil	Loam	70-130 ppm	350-430 ppm	low	low N, P, K**	Ore	Loam	130 ppm	270-370 ppm	low	Hi N;Low P,K
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IMPACTS ON THE PHYSICAL ENVIRONMENT

Water-holding capacity: Texture and rock content can affect the soils' ability to hold water. The texture of the currently stockpiled approved waste rock subsoil (>230,000 cy) is a loam, as is most of the topsoil at the CR Kendall Mine. Only one stockpile identified as "clayey" subsoil actually sampled as a sandy loam, which denotes a lighter texture. Texture is basically the same for subsoil and leach pad ore.

The rock content of the approved waste rock subsoil and leach pad ore do not vary appreciably. Therefore, the water holding capacity for subsoil and leach pad ore would be similar.

Metals Uptake/Potential toxicity: Elemental thallium in elevated concentrations has been identified at the site in water, mine waste and soil. Thallium is a naturally occurring metal that is found as part of the background chemical profile throughout the mineralized areas in the North Moccasin Mountains, including the CR Kendall mine site. Mining activities exposed rock surfaces that contain thallium. Water passing through the mine wastes can pick up thallium.

The source of stockpiled suitable waste rock subsoil on site is the overburden that was taken from areas around the mine pits. These stockpiles were sampled and tested for thallium and arsenic (another common element near the CR Kendall mine mineralized zones). The purpose of the sampling was to evaluate the proposed cover material's propensity to leach thallium and arsenic. Samples of leach pads 3 and 4 ore were also collected and tested for these parameters.

The arsenic and thallium concentrations in the leach pad ore are similar to those levels in the subsoil, and hence the potential for metals uptake from either medium would also be similar.

Plant Rooting Depth: Some soil characteristics that can limit available plant rooting depth include a textural break, potential toxicity and compaction.

Textural Break: If the textures of topsoil and subsoil vary greatly a textural break can be created which could limit rooting depth by limiting water movement from one layer into another. The topsoil to be used as cover material can be classified as a loam, similar in texture to both the subsoil and leach pad ore. The data implies that should topsoil be placed directly over leach pad ore or the approved waste rock subsoil, there would not be a contrasting textural break at the topsoil/mine waste boundary that would limit root penetration.

IMPACTS ON THE PHYSICAL ENVIRONMENT

Compaction: The similarity in texture between the waste rock subsoil and the leach pad ore suggests that either material would behave in a similar fashion when subjected to a compaction by reclamation equipment. If compacted, heavy loams such as those prevalent at the CR Kendall mine can limit water infiltration, so measures must be taken to prevent overland flow and erosion. Contour ripping, rough microtopography, and a near-surface organic amendment will promote infiltration. To limit erosion, slopes greater than about 30% should have a rock content of 30-40%, if available.

Potential Toxicity: (See Metals Uptake/Potential Toxicity discussion above). The leach pad ore and subsoil are similar in metal content. Therefore, the potential toxicity would be essentially the same for either material.

Conclusions: A re-examination of material characteristics for both the stockpiled subsoil and the leach pad ore has revealed the following:

- Both materials have similar texture and rock fragment content. These physical characteristics render the materials similar in their water-holding capacities.
- Concentrations of arsenic and thallium are elevated in both the subsoil and the leach pad material. This is due to the naturally occurring concentrations of these two elements in the immediate geologic environment. The arsenic levels are lower in the leach pad material, while thallium concentrations are similar for both materials. Therefore, the potential for metals uptake by plants is similar for both the subsoil and the leach pad ore. The data suggests that the leach pad ore may contain less available arsenic for plants.
- Plant rooting depth is not limited by inherent texture, potential toxicity or compaction differences between the approved waste rock subsoil or leach pad ore.

There is no discernable environmental advantage to using the approved waste rock subsoil as part of the cover soil system. The leach pad ore has similar and in some cases superior (lower arsenic concentrations) characteristics. The in-place leach pad ore also has more plant-available nitrogen (an important fertility component) than the stockpiled subsoil. Covering leach pads with topsoil only is slightly superior to placing subsoil materials below the cover soil (Appendix A).

IMPACTS ON THE PHYSICAL ENVIRONMENT	
	<p>If the subsoil material is not used as a cover medium, it would be used as additional backfill in the Kendall and Barnes King pits. The placement of subsoil in the pits would help cover some pit highwalls, improve safety in those areas where highwalls were covered, and would potentially increase the likelihood that the mine pits would revegetate by providing a marginal growth medium for plants.</p> <p>Regardless of the ultimate cover profile, certain steps would be taken during the cover placement process to enhance the growth potential of the cover cap. Cover materials would be ripped (after placement) on the contour to limit compaction, prevent erosion and promote infiltration. Rockier coversoils will be placed on slopes. Spent ore and “subsoil” stockpiles are similar, but in-place leach pad material has slightly better growth characteristics (more plant-available N) than stockpiled subsoil (See Appendix A). A good organic amendment would provide more benefits -- at lower cost – than using stockpiled subsoil.</p>
<p>2. WATER QUALITY, QUANTITY AND DISTRIBUTION: Are important surface or groundwater resources present? Is there potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality?</p>	<p>[Y] Concentrations of thallium and arsenic in both subsoil and spent ore in leach pads may contribute to increased levels of these elements in surface water and groundwater. CR Kendall is currently collecting water at four locations around the mine site via seepage collection pumpback systems. The company will continue this practice until water quality standards are met or alternative collection and treatment systems are authorized. Eliminating the subsoil component from the cover cap would not have a significant effect on water quality or quantity. The leach pad ore contains almost equal amounts of these elements.</p>
<p>3. AIR QUALITY: Will pollutants or particulate be produced? Is the project influenced by air quality regulations or zones (Class I airshed)?</p>	<p>[N] Not using the subsoil would have no greater impacts to air quality than those experienced during active mining, and which have been analyzed in the Comprehensive Life-of-Mine Amendment Environmental Assessment, dated, September 1989. The same amount of material would be moved in any alternative evaluated.</p>
<p>4. VEGETATION COVER, QUANTITY AND QUALITY: Will plant communities be significantly impacted? Are any rare plants or cover types present?</p>	<p>[Y] Concentrations of thallium and arsenic in both subsoil and spent ore in leach pads may contribute to increased levels of these elements in vegetation. However, sampling one of the main revegetation grasses ten years after planting at both irrigated and nonirrigated sites at the mine site identified low concentrations (<1 ppm arsenic and \leq 3 ppm thallium) (See attached Appendix A). More monitoring of the vegetation is proposed to identify if thallium and arsenic are accumulating to levels that may be toxic to grazers on the site.</p>

IMPACTS ON THE PHYSICAL ENVIRONMENT	
	The only plant communities that would be significantly affected by closure are revegetated coversoil stockpiles. No rare species or "species of special concern" are involved, and most of the revegetation consists of common introduced species.
5. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS: Is there substantial use of the area by important wildlife, birds or fish?	<p>[N] The reclaimed mine area is currently used extensively by mule deer. Changing the reclamation cap would have no deleterious effect. Rather, it would hasten final reclamation of the remaining disturbed areas that would ultimately enhance wildlife use. DEQ would require vegetation monitoring to ensure the vegetation does not contain metals that would be hazardous to deer.</p> <p>Peregrine falcons were introduced to the mine site with the hope that they would nest on the pit highwalls. It appears none have remained.</p>
6. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES: Are any federally listed threatened or endangered species or identified habitat present? Any wetlands? Species of special concern?	[N] This action is limited to existing disturbances. These areas were examined as part of the Life-of-Mine Amendment EA produced in September 1989.
7. HISTORICAL AND ARCHAEOLOGICAL SITES: Are any historical, archaeological or paleontological resources present?	[N] The site occupies a historic mining district. The site was examined for archeological, historical and paleontological resources and impacts were analyzed as part of the Life-of-Mine Amendment EA in September 1989. Impacts associated with this action fall within this review.
8. AESTHETICS: Is the project on a prominent topographic feature? Will it be visible from populated or scenic areas? Will there be excessive noise or light?	[N] This action is consistent with the impacts identified as part of the Life-of-Mine Amendment EA published in September 1989.
9. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY: Will the project use resources that are limited in the area? Are there other activities nearby that will affect the project?	[N] This action is limited to surface reclamation using existing stockpiled topsoil and approved waste rock subsoil materials. There would be no development or use of additional natural resources.

IMPACTS ON THE PHYSICAL ENVIRONMENT	
10. IMPACTS ON OTHER ENVIRONMENTAL RESOURCES: Are there other activities nearby that will affect the project?	[N] This action is limited to reclamation activities. No other environmental resources would be impacted as a result.

IMPACTS ON THE HUMAN POPULATION	
11. HUMAN HEALTH AND SAFETY: Will this project add to health and safety risks in the area?	[Y] This action would bring the site closer to final reclamation. Other reclamation activities currently authorized would proceed as well. This include: fencing of mine pits, establishment of a permanent public access road, revegetation of remaining disturbed areas, elimination of mine related disturbances (e.g., pipes, ditches, equipment). In general, this action would reduce the level of industrial disturbance at the site. Use of the subsoil materials for pit backfill would also eliminate some pit highwalls. These activities add to overall public health and safety by limiting opportunities for exposure to potentially harmful situations.
12. INDUSTRIAL, COMMERCIAL AND AGRICULTURAL ACTIVITIES AND PRODUCTION: Will the project add to or alter these activities?	[N] Final surface reclamation of the mine site would occur as a result of this action. There are no corollary effects on industrial, commercial or agricultural activities associated with the surface reclamation.
13. QUANTITY AND DISTRIBUTION OF EMPLOYMENT: Will the project create, move or eliminate jobs? If so, estimated number.	[N] This action may result in a temporary increase in local employment, but this would be of short duration (< 1 year). Employment, if local, would probably be less than 10 people.
14. LOCAL AND STATE TAX BASE AND TAX REVENUES: Will the project create or eliminate tax revenue?	[N] This action would not alleviate the current taxpayer from local fiscal responsibility. The current taxpayer associated with the site would continue its presence at the site during the reclamation.
15. DEMAND FOR GOVERNMENT SERVICES: Will substantial traffic be added to existing roads? Will other services (fire protection, police, schools, etc.) be needed?	[N] No additional government services would be required as part of this action.

IMPACTS ON THE HUMAN POPULATION	
16. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS: Are there State, County, City, USFS, BLM, Tribal, etc. zoning or management plans in effect?	[N] This action is consistent with the intent of the currently approved CR Kendall operating permit.
17. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES: Are wilderness or recreational areas nearby or accessed through this tract? Is there recreational potential within the tract?	[Y] The permanent access to federal (BLM) land would not be altered by this plan.
18. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING: Will the project add to the population and require additional housing?	[N]
19. SOCIAL STRUCTURES AND MORES: Is some disruption of native or traditional lifestyles or communities possible?	[N] This action is limited to surface reclamation. There would be no impact to the social tapestry of the local community.
20. CULTURAL UNIQUENESS AND DIVERSITY: Will the action cause a shift in some unique quality of the area?	[Y] This action would bring the site closer to final reclamation which itself would enhance the immediate area by revegetating currently disturbed areas.
21. PRIVATE PROPERTY IMPACTS: Are we regulating the use of private property under a regulatory statute adopted pursuant to the police power of the state? (Property management, grants of financial assistance, and the exercise of the power of eminent domain are not within this category.) If not, no further analysis is required.	[Y] This action would be permitted under the authority of the Metal Mine Reclamation Act 82-4-337 (3), MCA.

IMPACTS ON THE HUMAN POPULATION	
22. PRIVATE PROPERTY IMPACTS: Does the proposed regulatory action restrict the use of the regulated persons' private property? If not, no further analysis is required.	[N]
23. PRIVATE PROPERTY IMPACTS: Does the agency have legal discretion to impose or not impose the proposed restriction or discretion as to how the restriction will be imposed? If not, no further analysis is required. If so, the agency must determine if there are alternatives that would reduce, minimize or eliminate the restriction on the use of private property, and analyze such alternatives.	[NA]
24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:	[N]

25. ALTERNATIVES CONSIDERED:

No Action: The current plan as approved by DEQ in July 2000 calls for placement of 17 inches of topsoil and 19 inches of stockpiled subsoil on the process valley disturbances.

Proposed Action: The proposed action submitted by CR Kendall on March 8, 2001 is the same as the approved plan.

Agency Modified Plan: DEQ has evaluated the reclamation materials and recommends that the approved plan be changed to place 17 inches of topsoil only as discussed in number 1 above. The approved waste rock subsoil would only be used for other reclamation purposes such as backfilling some portions of the pits to enhance reclamation of those areas. DEQ would also require monitoring of the vegetation over time to identify if harmful levels of thallium and arsenic are accumulating in the reclaimed area vegetation. This is the preferred alternative.

26. PUBLIC INVOLVEMENT: A letter was sent to the CR Kendall mailing list in August 2001 updating the residents on the reclamation status at the mine site. A legal notice has been published in the Lewistown News Argus in August 2001. A press release will be issued with this EA and will be sent to the Lewistown News Argus, Billings Gazette and Great Falls Tribune. The press release will be issued to the State of Montana Newslink service. The legal notice, press release and EA will all be listed in the DEQ webpage www.deq.state.mt.us.

27. OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION: None.

28. MAGNITUDE AND SIGNIFICANCE OF POTENTIAL IMPACTS: The impacts from the agency modified reclamation plan would result in slightly improved reclamation on the site.

29. CUMULATIVE EFFECTS: No cumulative effects on area resources from the combined current and reasonably foreseeable activities in the area are projected. DEQ continues to review CR Kendall's proposed amended water management plan. No water from the site would be released unless it meets standards set by DEQ in an Administrative Order or MPDES permit.

30. RECOMMENDATION FOR FURTHER ENVIRONMENTAL ANALYSIS:

☐ EIS ☐ More Detailed EA ☒ No Further Analysis

31. EA CHECKLIST PREPARED BY:

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Approved By:

Signature

Date

Warren D. McCullough, Chief
Environmental Management Bureau

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